

Sand, Water, Science

February, 2015



Sand Materials / Props

- **Construction:** rocks, toy trucks/excavators, signs, hard hats, etc.
- **Farm/Zoo:** animals, people, fences, vehicles, rocks, wood, buildings
- **Dinosaurs:** dinosaur figures, shells, rocks, plants, leaves, pine cones, twigs, other natural objects
- **Paleontologist:** add clean chicken or beef bones to sand or have children make “fossils” using plaster of Paris ... paint brushes, rubber gloves, magnifying glasses, goggles, etc. help to excavate the bones; add sieves, shovels, etc.
- **Cooking:** bowls, wooden spoons, cookie cutters and trays, measuring cups and spoons, buckets, molds, sifters, funnels, utensils etc.
- **Patterning:** sand molds, combs, cookie cutters, potato mashers, containers, etc.
- **Garden/Zen Garden:** soil, seeds, plants, row markers; rocks, branches, rakes, twigs, etc.
- **Habitats:** caves, burrows, tunnels, made with various materials, such as rocks, leaves, twigs, insect/animal models, etc.
- **Camera, paper, writing tools ...** to document learning/label habitats/create signs for communities, etc .
- **Books/images to support inquiry:** build on children’s interests by providing images or books for reference in a nearby location
- **Alternatives:** rice, pellets, foam bits, etc.



Sand & Water

Both the Sand and Water centre provide children with very **tactile learning** experiences. For **variety**, the sand table can be alternated with the water table. Tools for **clean up** should be store close at hand: dustpan and broom for the sand table, and sponges, paper towels, or mops to clean up spills at the water table. Locating the water table near the sink makes filling and emptying easier, which should be done every other day. Adding a small amount of food colouring to the water makes it easier to see levels in containers and plastic aprons help to keep young scientists dry.

Water Materials / Props

- **Basic materials:** buckets, funnels, pumps, water wheels, measuring cups, clear plastic hoses, sponges, etc.
- **Bubbles/Clouds:** add dish soap and egg beaters, meat basters, whisks, pumps, straws, etc.
- **The Sea:** boats, plastic marine life, habitat props
- **Boat making:** provide materials to make personal boats (egg cartons, plasticene, paper, tape, etc.). Investigate which materials work best in water ... What sinks? What floats? What becomes water-logged?
- **Snow:** balance scales, shovels, molds, thermometers, mittens
- **Spring cleaning:** wash toys in bubbly, soapy water
- **Colour mixing:** baby food jars, eye droppers, primary colours
- **Sink and float:** predict then test; provide a variety of objects that will sink and float; laminated graph for children to sort objects or later record
- **Absorbency:** which materials soak up water? Which repel water?, etc.
- **Flow:** ramp, funnels, tubes, scoops

Science as inquiry ... Frequent opportunities to predict, investigate, estimate, classify, and graph hone children’s inquiry skills. Modeling the use of “I wonder ...,” “What if ...?” and “How can you find out?” introduces children to the basis of science inquiry. When children pose a question, we can introduce the process of observing, researching, creating and testing hypotheses, and collaborating to find answers.

(Bosse, Jacobs, & Anderson, 2009, p. 12)



Science ... Wonder ... Discovery

Many of the skills and habits of scientific thinking are inherently part of children's play (Hamlin & Wisneski, 2012, p. 85).

Discovery Materials / Props

- living things – plants, animals, larvae, beetles
- bird nests, bee hives/wasp nests
- pine cones, twigs, stumps of wood
- aquarium/terrarium
- ant farm
- collections – rocks, shells, leaves, etc.
- tools: magnets, magnifying glass, mirrors, thermometers, balances, binoculars, prisms, compass, microscope, timer, eye dropper, mirrors, light sources, etc.
- images or books on related topics
- signs, labels, questions, puzzles
- paper, writing tools, cameras, sorting mats, etc.

In-depth explorations

Long-term studies or projects focusing on science-related topics let children achieve a much deeper understanding of scientific concepts than do isolated activities or experiences. **The topic of study depends on the children's interests and the resources available.** Note the topics that children raise in conversations and provide opportunities to explore various sources of information on the topic ... books, images, films, experts, etc. (Bosse, Jacobs, & Anderson, 2009, p. 11).

Design keys

The key to designing a quality discovery area is carefully selecting a **variety of age-appropriate materials** (such as magnifiers, a balance scale, prisms, plants, etc.) that will introduce children to the **wonders of the natural world**. Rotate additional natural materials, books, and manipulatives to reinvigorate interest and reflect seasonal changes (Bosse, Jacobs, & Anderson, 2009, p. 10).

Teachers supporting scientific play (Hamlin & Wisneski, 2012, p. 86)

How can teachers use play as opportunities to engage young learners in scientific inquiry? The key is in the types of experiences teachers create for young learners and how they support children during "science play" (Commonwealth of Australia 2009/2012) experiences. When teachers create science-play experiences, it is important for them to consider three things:

- the types of **materials** to provide;
- the **questions** to pose prior to, during, and after children's exploratory play;
- and what **additional explorations** could further children's science learning opportunities.

